

ABSTRACT

A compact and efficient optical illumination system featuring planar multi-layered LED light source arrays concentrating their polarized or un-polarized output within a limited angular range. The optical system manipulates light emitted by a planar array of electrically-interconnected LED chips positioned within the input apertures of a corresponding array of shaped metallic reflecting bins using at least one of elevated prismatic films, polarization converting films, micro-lens arrays and external hemispherical or ellipsoidal reflecting elements. Practical applications of the LED array illumination systems include compact LCD or DMD video image projectors, as well as general lighting, automotive lighting, and LCD backlighting.